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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/522,158	10/24/2005	Camiel Heffels	HEFF3002/FJD	3571

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EXAMINER	
GIGLIO, BRYAN J	

ART UNIT	PAPER NUMBER
2877	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/522,158	HEFFELS ET AL.	
	Examiner	Art Unit	
	Bryan J. Giglio	2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 January 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *20-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *20-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 January 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 22-28, 32, 33, 34, 36, and 37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In regard to claims 22-26, 28, 34 and 37, the claims are replete with the phrases "respectively" or "as the case may be" which are remnants of the multiple dependent claim format of the original claims 1-19. As the current claims stand, where none of claims 22-38 depend from claim 21, these phrases make the metes and bound of each claim indefinite, and provide alternatives which lack antecedent basis. In the case of claims 26 and 37, interpretation of the claims is extremely difficult due to these discrepancies. Each claim will be rewritten below in regard to how it will be interpreted, after additional indefiniteness is described.

In regard to claims 26, the limitation "a grid rail" is recited in line 2, and "said guide rail" is recited in line 4. "said guide rail" lacks antecedent basis and therefore "a grid rail" will be construed to mean "a guide rail". "said holding device" in line 3 also lacks antecedent basis.

In regard to claim 28, the limitation "said holding device" in line 4, lacks antecedent basis, and will be construed to mean "a holding device".

In regard to claim 32, it is unclear whether "a thin diamond coating" is applied to "a high-purity semiconductor material", "another IR-transmittive material", or both. For the purposes of applying art, the "coating" will be construed to apply to both.

In regard to claim 33 and 36, the limitation "preferably", in each occurance, makes the metes and bounds of the claim unclear and indefinite.

In light of the above rejections, for the purposes of applying art, claims 22-28, 32, 33, 34, 36 and 37 will be construed to mean the following:

22. (New) The device as claimed in claim 20, wherein: said control/evaluation unit controls the relative movement between said detector element and linear variable filter, stepwise or continuously.

23. (New) The device as claimed in claim 20, wherein: said detector element is mounted fixedly; and said control/evaluation unit moves said linear variable filter stepwise past said detector element.

24. (New) The device as claimed in claim 20, wherein: said linear variable filter is mounted fixedly; said control/evaluation unit moves the detector element stepwise past said linear variable filter

25. (New) The device as claimed in claim 20, further comprising: a holding device, in which said detector element and said output section are mounted.

26. (New) The device as claimed in claim 20, further comprising: a guide rail, wherein: a holding device, said detector element, said radiation source or said linear variable filter are arranged on said guide rail.

28. (New) The device as claimed in claim 22, further comprising: a drive wherein: said drive is provided for moving said linear variable filter, said detector element, said radiation source, or a holding device for said detector element, stepwise or continuously.

32. (New) The device as claimed in claim 20, wherein: said reflection element is manufactured from a high-purity semiconductor material or another IR-transmittive material, to both of which a thin diamond coating is applied.

33. (New) The device as claimed in claim 20, wherein: said reflection element comprises a microprism.

34. (New) The device as claimed in claim 20, wherein: said reflection element is so dimensioned and embodied that the ray path of said measuring light, respectively reference light, undergoes a plurality of reflections in said reflection element; and the number of reflections is determinable via the length of said reflection element.

36. (New) The device as claimed in claim 35, wherein: said first wave guide comprises a plurality of fibers and has on the side of said linear variable filter fiber cross-section converter and on the side of said reflection element a cross-section converter; and said second wave guide comprises a plurality of fibers and has on the side of said reflection element a fiber cross-section converter and on the side of said detector a quadratic fiber cross-section converter.

37. (New) The device as claimed in claim 36, wherein: the two fiber cross-section converters are integrated on the side of said reflection element, or on the microprism, or into at least one holder, or into at least one plug, or in the immediate vicinity of the cross-sectional area of said reflection element, or on the cross-sectional area of said reflection element.

Claim 35 is rejected as dependent upon a previously rejected claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 20-29, 31, 34, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnston, et. al. (U.S. Patent No. 5815278) in view of Gillispie (U.S. PGPub. No. 20020158211 which incorporates U.S. Patent No. 5828452), and well known practices in the art.

In regard to claim 20 the Johnston reference teaches a device for IR-spectrometric (see c.16, l.14-17) analysis of a solid, liquid or gaseous medium (see c.25, l.28-33), comprising: a process probe, which has a reflection element (see fig.12A or fig.6), a linear variable filter (see c.24, l.14-15, wedge etalon), at least one detector element (see c.24, l.12-13, "monochrometers, mechanically tunable wavelength output and a single detector"); and a control/evaluation unit (see c.20, l.64-66), wherein: at least one radiation source is provided, whose electromagnetic radiation is coupled into said reflection element (see fig.12A and c.23, l.54—c.24, l.7), at least one waveguide is provided (see fig.6), having an input section and an output section. The Johnston reference is silent to the system where the electromagnetic radiation is conducted via the output section of said waveguide into at least one defined area of said linear variable filter; said detector element and said linear variable filter are arranged movably relative to one another over essentially the length of said linear variable filter; and said control/evaluation unit determines the spectrum of the medium on the basis of the measured values delivered from said detector element, per se. The Johnston reference does teach that a variety of filtering arrangements may be used (see c.24, l.8-23) including "wedge etalons" and "linear variable interference filters". Applicant admits IR linear variable filters are well known (see specification, page 10, pgh. 5). The Johnston reference further teaches that one filtering option is to use a "mechanically tunable wavelength output and a single detector". It doesn't explicitly teach the arrangement for doing so, however the Gillispie reference shows using a linearly variable filter and single detector which move relative to each other in order to determine the spectrum (see

'211, fig.1, and fig.3) for the benefit of reducing cost with a single detector (see '452, c.7, l.43). As stated, the Johnston reference suggests this arrangement.

Therefore it would have been obvious to a person having ordinary skill in the art to which the subject matter pertains to use the linearly variable mechanically adjustable single detector scheme as suggested by Johnston, explicitly in an arrangement as shown by Gillispie, because a single detector arrangement reduces cost.

In regard to claim 21, the only difference between claim 21 and 20 is that the electromagnetic radiation is coupled, after passing through said linear variable filter, into the reflection element, the focused electromagnetic radiation coming from said radiation source and said linear variable filter are arranged movably relative to one another over essentially the length of said linear variable filter; said detector element receives the electromagnetic radiation after it has passed through said reflection element; and said control/evaluation unit determines the spectrum of the medium on the basis of the measurement values delivered from said detector element, or in other words the source emission is passed through the variable filter prior to entering the probe, instead of the filtering occurring at the detector. The Johnston reference teaches all of the other elements. The Johnston and Gillispie combination as cited above further teaches passing emission light through a linearly variable filter prior to enter the reflection element. In particular the Johnston reference teaches that a source my be broadband or have multiple wavelengths which must then be filtered using the filtering arrangements as taught above (see c.23, l.57-60), and the Gillispie reference also teaches applying the filtering arrangements to the source light (see fig.2b). Therefore all of the elements of claim 21 are taught as cited and combined above further considering these aspects of the Johnston and Gillispie.references.

In regard to claim 22, the Gillispie reference teaches the device wherein said control/evaluation unit controls the relative movement between said detector element and linear variable filter, stepwise or continuously (see '211, [0053]).

In regard to claim 23, the Gillispie reference teaches the device wherein: said detector element is mounted fixedly; and said control/evaluation unit moves said linear variable filter stepwise past said detector element (see '211, fig.3).

In regard to claim 24, the Johnston/Gillispie combination as cited above is silent to moving a detector element along a fixed linear variable filter, per se. The combination teaches relative movement as cited above, and the variation between one or another element being fixed or moving relative to each other is optically equivalent and official notice is hereby taken that it would have been obvious to use this equivalent variation in order to maintain constant position of the filter element relative the device in whole.

Therefore it would have been obvious to a person having ordinary skill in the art to which the subject matter pertains to substitute the moving filter, fixed detector arrangement, as taught by the Johnston/Gillispie combination, with the optically and functionally equivalent fixed filter and moving detector arrangement, in order to maintain constant position of the filter relative to the device in whole.

In regard to claim 25, the Gillispie reference teaches the device further comprising: a holding device, in which said detector element and said output section are mounted (see '211, fig.1, element 120 and 126, inherently mounted).

In regard to claim 26, the Gillispie reference teaches the device further comprising: a guide rail, wherein: a holding device, said detector element, said radiation source or said linear variable filter are arranged on said guide rail (see '211, fig.3).

In regard to claim 27, the Johnston reference teaches the device wherein: said output section or said input section includes a cross-section converter (see fig.12B).

In regard to claim 28, the Gillispie reference teaches the device further comprising: a drive wherein: said drive is provided for moving said linear variable filter, said detector element, said radiation source, or a holding device for said detector element, stepwise or continuously (see '211, fig.3).

In regard to claim 29, the Johnston reference teaches the device wherein: said at least one waveguide is an optical fiber duplexer (see fig.12B and 16B), via which the measuring radiation and a reference radiation are guided to said reflection element; and the measuring beam and the reference beam are conducted to said linear variable filter (see c.19, l.46-65, "reference region" couple to the light pipe would inherently be couple to the detector via the filter for comparison; see also c.20,l.58-c.21,l.4, "fiber couplers").

In regard to claim 31, the Johnston reference teaches the device wherein: said reflection element is manufactured from a high-purity material semiconductor (see c.5, l.28-33, "crystal" and "sapphire").

In regard to claim 34, the Johnston reference teaches the device wherein: said reflection element is so dimensioned and embodied that the ray path of said measuring light, respectively reference light, undergoes a plurality of reflections in said reflection element; and the number of reflections is determinable via the length of said reflection element (see fig.6, and see also c.5, l.28-34).

In regard to claim 38, the Johnston reference teaches the device wherein: said process probe comprises an ATR probe, a reflection probe or a transmission probe (see c.26, l.1-12).

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnston and Gillispie, cited above, in view of Busch, et al. (U.S. Patent No. 5473162).

In regard to claim 30, the Johnston Gillispie combination teaches all of the elements of claim 20, from which claim 30 depends, as cited above. It is silent to the device wherein: said detector element comprises a pyroelectric detector, preferably a thermopile or an MCT detector, or a detector array. The Johnston reference teaches that an IR detector would be necessary instead of silicon (see c.16, l.14-17). The Busch reference details IR type detectors, including thermocouple and pyrolytic detectors (see c.12, l.30-49).

Therefore it would have been obvious to replace the detectors as taught by Johnston with the IR detectors as taught by Busch in order to take advantage of the IR spectrum in the Johnston reference.

Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnston and Gillispie, cited above, in view of Melling (U.S. Patent No. 5754722).

In regard to claim 32, the Johnston Gillispie combination teaches all of the elements of claim 20, from which claim 32 depends, as cited above. It is silent to the device wherein: said reflection element is manufactured from a high-purity semiconductor material or another IR-transmittive material, to both of which a thin diamond coating is applied. The Melling reference teaches an ATR probe having a diamond coating in order to enhance the probes chemical resistance (see c.4, l.5-10). This is beneficial in the chemical testing probe arrangement of Johnston (see fig.12A).

Therefore it would have been obvious to a person having ordinary skill in the art to which the subject matter pertains to coat the probe as taught by Johnston with diamond as taught by Melling, in order to improve chemical resistance during testing.

Allowable Subject Matter

Claims 33, and 35-37 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

As to claim 33, the prior art of record, taken alone or in combination, fails to disclose or render obvious a microprism, in combination with the limitations of claim 33.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bryan J. Giglio whose telephone number is (571) 270-1028. The examiner can normally be reached on M-F, 7:30AM-5:00PM EST, Alt. Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Toatley can be reached on (571)272-2059. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BG
7 June 2007

Gregory J. Toatley, Jr.
Supervisory Patent Examiner
11 June 07